a dose of 20 grammes in three glasses of water, it usually produces four or five stools; and from five to eight in doses of 25 grammes. The effects usually begin to manifest themselves an hour after it has been taken. 3. The sulphovinate is the mildest of saline purgatives; it produces no exhaustion or pain, and it may even cause colics previously experienced to disappear, as for instance in certain forms of diarrhœa, which it is capable of speedily arresting. 4. This salt, causing no pain, no abnormal intestinal contraction, acting, in a word, as a type of dialytic purgatives, can be prescribed even during menstruation and pregnancy. 5. In consequence of its very slight flavour when slightly sugared, it is taken without repugnance by the most fastidious, and by children. 6. The sulphovinate of soda ought to be preferred to the citrate of magnesia, since it possesses the advantages, without the disadvantages, of the latter. In the first place, it is more agreeable to the taste, especially when dissolved in Seltzer water; secondly, it cannot lead to the formation of calculus. It is well known that it is dangerous to continue the use of the magnesian salts too long, and no judicious physician would prescribe the citrate to old people, especially to those affected with catarrh of the bladder, lest the ammoniaco-magnesian phosphate should be precipitated.—*Practitioner*, April, 1872, from *Revue de Thérap. Méd.-Chir.* 1871.

21. *A Zootrophic Powder.*—M. POLLI, after dwelling on the importance of the presence of the various mineral constituents of the body in food, if the healthy nutrition of the tissues is to be maintained, recommends the following powder, as containing some of the most essential: Phosphate of lime 10 parts; tribasic phosphate of lime, 10 parts; phosphate of soda, 15 parts; carbonate of lime, 10 parts; sulphate of magnesia, 15 parts; chloride of sodium, 10 parts; bicarbonate of potash, 15 parts; oxide of iron, 10 parts; oxide of manganese, 2.5 parts; silicate of potash, 2.5 parts. The dose of this powder is 45 grains daily for children, or double this quantity for an adult. He recommends its use especially—1. In infants at the breast, who are suffering from dentition, or in nurses. 2. In children suffering from osteo-malacia, rachitis, scrofulosis, or chlorosis. 3. In pregnant women, and those suffering from puerperal cachexia. 4. In fractures, and cases of caries of the bones. 5. In tuberculosis, especially when there are vomicæ. 6. In anæmia after hemorrhages, and in leucocythæmia. 7. In convalescence after long illness.—*The Practitioner*, May, 1872, from *Medizinisch-chirurgische Rundschau*, Feb. 1872.

MEDICAL PATHOLOGY AND THERAPEUTICS, AND PRACTICAL MEDICINE.

22. *Experiments on Pyœmia.*—Dr. BURDON SANDERSON made a most interesting and important communication to the Pathological Society of London on pyæmia. He began by relating his first experiments as to the effect of inoculating the lower animals with pyæmic liquids. In the autumn of 1867, he injected the purulent liquid contained in the ankle-joint of a patient, who had died a few hours before with metastatic abscesses, general suppurative arthritis, and intense septicæmia, under the skin in a dog and two guinea-pigs. The two guinea-pigs died within short periods (fifteen and twenty days), and exhibited symptoms of great intensity. Both had metastatic abscesses; but in one the lungs were already beset with minute nodules, resembling miliary tubercles. The dog lived seven weeks. In this case there were no secondary abscesses, but miliary tubercles of the liver and spleen. From one of the guinea-pigs, two others were inoculated, of which one died of pyæmic subcutaneous abscesses, without visceral disease; the other, which lived longer, had no abscesses, but tuberculous disease of the lungs. During the same winter, other experiments of the same kind were made, all of which seemed to show that, by the inoculation of pyæmic products, two sets of lesions might be produced: as an imme-

diate result, metastatic abscesses, accompanied by a general typhoid state, which was often fatal; as an ulterior result, either disseminated nodules, at first hard, but afterwards becoming caseous at their centres, or interstitial induration—both forms of lesion having their seat chiefly in the lungs, spleen, and liver, but also occurring in other viscera.

Having stated these facts, which he said had even in 1868 led him to regard it as probable that the two forms of infective lesions—the tuberculous and the pyæmic—were connected together etiologically and genetically, he referred to another fact which resulted from experiments made in 1871, as to the existence of bacteria in animal liquids, and the circumstances which determined their occurrence. These experiments had shown, that whereas bacteria could not be shown to be present either actually or in germ in the healthy liquids or tissues, or in the products of healthy inflammation, they were present potentially in pyæmic liquids—that is to say, that, whereas ordinary pus could be kept for days or even weeks free from bacteria, provided the precautions against "spontaneous generation" were observed, pyæmic pus could not be so kept, and, moreover, possessed the properties of at once determining the development of bacteria in any suitable liquid to which it was added. At that time he had concluded, as he now knew, from insufficient observation, that pyæmic pus did not itself contain visible bacteria.

A short account was next given of certain researches made during last summer, in association with Dr. Klein, as to the channels by which infective poisons were distributed from their centres of origin. • Referring to the last occasion on which he had brought the subject of the intimate pathology of tubercle before the Society, and to the doctrine he had then advocated, that tuberculosis is an irritative overgrowth of a pre-existing tissue, he said it had then been shown that the process, in its disseminated or interstitial form, had its seat in a certain tissue, and this tissue had been termed adenoid or lymphatic —both words implying its intimate and special relation with the lymphatic system; but the precise anatomical nature of this relation had been imperfectly made out. No further progress was made till last May, when Dr. Klein came to England with the distinct object before him of co-operating in the investigation of this very question. The field taken up was the peritoneum; the reason of the choice being, that that membrane, and especially the omentum and diaphragm, had already been the subject of investigation, as favourite seats of tuberculosis. Those researches had not merely served to elucidate one or two anatomical facts of very great importance to the pathologist—*e. g.*, the existence of a lymphatic system in the omentum and its distribution, and the mode in which the peritoneum communicates with the lymphatic system—but had rendered it possible to give an account which, so far as the peritoneum was concerned, was tolerably exact and complete, both of the normal process of absorption and of the changes which the absorbing tissues undergo when they are entered by infective agents.

In the course of these experiments, it was found that not only as regarded the property of any given peritonitis to assume the infective character, but as regarded the intensity of the infective results and their duration, there were endless varieties. In one set of cases, the secondary lesions were suppurative, the constitutional disturbance intense, and the fatal result rapid; in another, the lesions were vascular new growths, firm at first, afterwards becoming caseous, the progress slow, and the functional disturbance imperceptible. And then it appeared that in all those instances in which the pyæmia—*i. e.*, the acute character—manifested itself, bacteria were present, not merely in the purulent liquids, but in the blood. Under these circumstances, attention was directed from the effects to the poison itself. Soon after the opening of the Brown Institution, it was found that the practice of the hospital for animals was likely to afford the required material; in short, that pyæmia occurred in dogs under circumstances very similar to those which determined it in human beings; and exhibited similar symptomatical and pathological aspects. A series of experiments were therefore commenced in January last, having for their object to acquire a knowledge of the morbid poison, and particularly to discover by what conditions the variations of its intensity were governed.

With reference to these experiments, Dr. Sanderson would not anticipate the complete account of them in the Report of the Medical Officers of the Privy Council, but would confine himself to giving an account of one series, and exhibiting the action of the pyæmic poison during life, and the *post-mortem* appearances; but before doing so, he would state shortly what he understood to be the true signification of the term pyæmia. He then proceeded to say:—

"The word pyæmia is apt to be used in somewhat different senses, according as the person using it has before him the medical or surgical aspect of the disease. To define it completely we must, I think, take into account its mode of origin, its symptoms, and the anatomical changes which it produces; not confining our attention to either of these to the exclusion of the rest. With this consideration in view I would comprehend in my definition the following propositions:—

"1. Pyæmia originates by the introduction into the living tissues, and eventually into the blood, of a *poison* which is itself a *product of inflammation.*

"2. The action of this poison manifests itself in an alteration of the blood, and in disorder of the vital functions. The former of these is characterized by the presence of bacteria, and by change in the optical characters of the blood, which often becomes obviously more transparent and darker by reflected light than it is naturally. Of the latter, viz., the general disorder of the vital functions, the most prominent phenomenon is fever, which, in the more intense forms of the affection, is followed by collapse which culminates in death.

"3. More remotely, the disease manifests itself in secondary suppurations, *i. e.*, in the formation of metastatic abscesses, which may occur either in the internal organs or underneath the skin. The special characters of these metastatic (as I am in the habit of calling them) infective abscesses are those which are well known both to surgeons and physicians. They have the additional less known character, that the pus they contain is full of bacteria.

"Pyæmia *differs* from tuberculosis in the rapidity of its progress, and in the obvious character of the anatomical changes of which it consists. Whereas, by tuberculosis we are understood to mean anatomically the overgrowth of cells in certain tissues, which we designate lymphatic on account of their proved anatomical relation to the lymphatic system, the secondary inflammations of pyæmia result in the formation of infective abscesses.

"Pyæmia resembles tuberculosis in its mode of origin. Both spring from inflammations; and, so far as relates to the anatomical characters of the lesions, both are inflammations. To both, therefore, the term secondary or infective inflammation is applicable.

"So much for the disease itself. Let me now," says, Dr. Sanderson, "draw your attention to the nature of the poison. I wish to show (1) that every pyæmic abscess contains a poison, which, when introduced either into the circulation or into a serous cavity, produces the symptoms of pyæmia; and (2) that we have this poison so entirely in our possession, and so far under control, that, beginning with an agent so mild in its action that it produces no marked symptoms, we can convert it into an agent of such intensity that it kills in two or three hours with the formidable symptoms seen in the case we have now before us.

"This intensification is effected by a process which may be called cultivation. Dr. Klein made the important discovery that, if a pyæmic liquid were transferred to the peritoneum of a guinea-pig, and allowed to remain there for a couple of days, although it did not at first produce any intense symptoms in the animal itself, its toxic intensity increased in such a degree that, when the transudation-liquid produced in this was injected into another animal, it had acquired the most deadly activity; and that all such extremely active liquids were crowded with bacteria of a peculiar character, the increased number of which seemed to be in proportion to their toxic properties."

Dr. Sanderson then proceeded to exhibit a dog, into the abdominal cavity of which six drops of a pyæmic transudation-liquid had been injected three hours before. The animal was in a state of profound collapse, accompanied with vomiting, purging, and cramps of the extremities. Shortly afterwards, the animal was killed and the abdominal cavity opened. The peritoneum contained liquid slightly stained with blood, which, on microscopical examination, was found to be crowded with bacteria. The intestines were distended with a frothy liquid, which possessed none of the characters of the natural contents which had been found in other cases to be charged with shed epithelium. The internal surface of the whole of the alimentary canal from the stomach downwards was intensely infected, and presented appearances which (as had been found by more careful investigation in previous cases) were due to the separation of the epithelium from the surface of the mucous membrane, and the infiltration of that tissue with liquid.

The material which produced these results was obtained as follows: Pus from a pyæmic abscess of spontaneous, *i. e.* accidental, origin was introduced into the peritoneal cavity of a guinea-pig and allowed to remain there for two days. It was then withdrawn from the guinea-pig and some of it at once injected into the peritoneum of a dog. The dog was affected in exactly the same way as the animal exhibited to the Society. The remainder of the liquid was kept for five weeks in hermetically sealed tubes, after which six drops were injected into the peritoneum of a guinea-pig; this showed its action to have become relatively feeble. After two days, the transudation-liquid produced was (on the day before the meeting) tested with a third guinea-pig and found to be extremely active. This afternoon it was injected into the peritoneum of the dog exhibited.

Dr. Sanderson then concluded by saying: "Such are the facts. The all-important question remains—Do these experiments concern us as physicians and surgeons, or not? I think they do. But what I want is to prove it; for I am well aware, that unless clinical observation comes in aid of pathological experiment, the results of the latter do not tell practically. Let me state what are the lines of inquiry which I desire to see taken up. The first question is —Do the characters which we have shown to be present in the products of acute secondary inflammation in the lower animals, also exist in similar products in man? The second is more important still—Can it be shown that human pyæmic products, when tested by inoculation, possess exactly the same morbific properties as those which are possessed by the liquids to which our experiments relate? It is for answers to these inquiries that I earnestly ask the assistance of hospital surgeons.

"Finally, I would say a word as to the limits of the question now before us. With regard particularly to the question of bacteria, I desire to keep to the bare facts of disease, and not to diverge into discussions as to their origin. It is a matter to me of comparative indifference how they originate. Our observations lead us to conclude, first, that they afford a *characteristic* by which we may distinguish the products of infective inflammations from those which are not infective, and that their number affords an indication of the degree of infectiveness; and, secondly, that their presence in the blood is an indication of that constitutional disturbance which accompanies infective inflammation; not merely when that disturbance assumes the degree of intensity of which we have an example before us, but in the slighter form of irritative fever. If these facts prove to be true, not only in the lower animals but in man, their importance is quite unaffected by any theory which we may entertain as to the origin of bacteria."

After some remarks by the members, Dr. S. replied shortly that, as regarded bacteria in general, he was well aware from his own experiments that the ordinary bacteria of putrefaction possessed no toxic action, and that liquids containing them could be injected into the circulation of living animals without result. As regarded the bacteria of pyæmic products, he had carefully guarded against the inference that they were the efficient causes of pyæmia. He regarded them as only characteristic inhabitants of infective liquids, and therefore very probably carriers of infection. As regarded the word septicæmia, he understood it to mean a state of the blood which was only present in the most intense forms of pyæmia; and he entirely agreed with Mr. Hulke in regarding metastatic abscesses as an accident rather than as an essential of pyæmic infection. The theory that the pyæmic poison was dependent upon an alkaloid, would be disproved in case it should appear that it was incapable of diffusion.

On this question, further inquiries were necessary.—*Brit. Med. Journ.*, May 11, 1872.

23. *Scleroderma Adultorum.*—Dr. J. Neumann calls attention to this remarkable form of cutaneous disease. Though individual cases were recorded by older writers, no special essay upon it appears to have preceded that by M. Thirial in 1845, who published in the *Gazette Médicale* an account of all the cases he had been able to collect, and applied the term "sclerema" to the affection. Since then no less than fifty cases have been reported, and M. Neumann himself adds three more to the list. In most of the cases the skin becomes gradually harder and more tense, though in some instances, and especially when the attack is acute, there is a preliminary stage of œdema. Hebra and Rasmussen distinguish two forms of the disease—"Sclerema elevatum" and "S. atrophicum," of which the former is the acute and the latter the chronic type. The disease has been preceded sometimes by rheumatism, sometimes by recurrent attacks of erysipelas, and occasionally it has appeared to originate in injury; but little is really known of its etiology. The symptoms are very variable; but there is always the disagreeable sensation of tension, impeding movement to a greater or less extent. Thus, if the sclerema affects the neck, the rotation and flexion of the head are interfered with. In sclerema of the face, the facial expression is lost, the natural lines and furrows are smoothed out, and the play of the features is lost; the eyelids droop; the alæ nasi are stretched, and the nose is flattened; the oral opening is contracted, and the movements of the lips rendered difficult. With regard to other parts of the body, the abdominal wall is made tense; the scrotum and penis so tense that no erection can occur; the elbows are bent: the fingers half extended and claw-like; the spinal column is bent forward, and the respiration even impeded. In one of Dr. Neumann's cases violent itching was complained of, and in this case the temperature was considerably elevated, though it is usually depressed. The secretion of the sebaceous follicles does not wholly fail, since pustules of acne have been observed to form. In some instances the secretion of sweat seems to be entirely arrested, but not in others. The disease has been observed to be associated with erythema, erysipelas proceeding to vesication, impetigo, ecthyma, eczema, partial teleangiectasis, ulcerations, and acne. It is more common in females than in males, and the majority of cases have occurred between the ages of twenty-five and forty, though one case is recorded in a patient aged six, and in another aged seventy-two. The pathological conditions of the skin that have been discovered under the microscope are hypertrophy and condensation of the subcutaneous cellular tissue, with coincident atrophy of the adipose tissue, deposit of pigment in the rete Malpighii, around the vessels, in the cellular investment of the several ducts, in the outer-root sheaths of the hair, and in the sebaceous follicles. The pigmentation, however, appears to bear no relation to the intensity of the disease, the densest parts being often the lightest colored. In one of Dr. Neumann's patients the epidermis was found to be unaltered, the cells of the rete Malpighii were increased in number, and formed wart-like processes, dipping into the cutis, not pigmented. The fibres of the cutis formed large and strong bands that preserved the characters of connective tissue, and were intermingled with thick trabeculæ of elastic tissue. Collections of cells occurred in the deeper parts of the corium, and in the panniculus adiposus, the fat of which was much atrophied. The sweat-glands were individually much hypertrophied, and the smooth muscular fasciculi were also much increased in size. The vessels running in the cutis were large and filled with blood, but the branches running towards the papillæ were small and empty. The hairs were small and woolly, but the sebaceous follicles were large. No treatment has been hitherto suggested that possesses any value in curing, or even in staying the progress of the disease.—*Lancet*, March 9, 1872.

24. *Pathology of Herpes Zoster.*—Dr. O. Wyss had the opportunity of carefully watching during life, and examining after death, a patient of von Witte's, of Rheinau, suffering from herpes. The patient was sixty-eight years of age, and on September 16th he had headache and febrile symptoms. On the 19th scattered